

## CLAIMS

What is claimed is:

1. A radio access network comprising:

5 at least one antenna structure for sending and receiving signals over at least one radio frequency air interface in communication with mobile stations operating in a coverage area of a base station;

paging logic for sending page messages to mobile stations via the antenna structure, wherein, for a given mobile station, the paging logic is arranged (i) to send a page message to the  
10 mobile station on a paging channel slot that the mobile station is set to monitor, (ii) to wait up to a time interval for a response from the mobile station and, (iii) absent receipt of a response from the mobile station by expiration of the time interval, to re-page the mobile station on a next time paging channel slot that the mobile station is set to monitor; and

interval-selection logic for selecting the time interval based on a paging slot cycle index  
15 of the mobile station.

2. The radio access network of claim 1, wherein:

the interval-selection logic is arranged to select a first time interval if the mobile station is operating at a first slot cycle index; and

20 the interval-selection logic is arranged to select a second time interval shorter than the first time interval if the mobile station is operating at a second slot cycle index smaller than the first slot cycle index.

3. The radio access network of claim 1, further comprising a base station controller, wherein the base station controller applies the paging logic and the interval-selection logic.

4. The radio access network of claim 1, further comprising a mobile switching center, wherein the mobile switching center applies the paging logic and the interval-selection logic.

5. The radio access network of claim 1, wherein the interval-selection logic operates dynamically to select the time interval when the radio access network is paging the mobile station.

6. The radio access network of claim 1, wherein the interval-selection logic operates to select the time interval for the mobile station after a determination is made of what slot cycle index will be used for paging the mobile station.

7. The radio access network of claim 1, wherein:  
the first slot cycle index is 2 and the second slot cycle is 0.

8. The radio access network, further comprising:  
a processor;  
data storage; and  
machine language instructions stored in the data storage and executable by the processor, the machine language instructions defining the paging logic and the interval-selection logic.

9. The radio access network of claim 1, wherein the mobile station is a cellular telephone.

10. A method comprising:

5 using a slot cycle index of a mobile station as a basis to select a failure-interval to use for re-paging the mobile station; and

using the selected failure-interval as a basis to determine when to re-page the mobile station.

10 11. The method of claim 10, wherein using the slot cycle index of a mobile station as a basis to select a failure-interval to use for re-paging the mobile station comprises:

if the slot cycle index is a first slot cycle index, selecting a first failure-interval; and

if the slot cycle index is a second slot cycle index smaller than the first slot cycle index, selecting a second failure-interval shorter than the first failure-interval.

15 12. The method of claim 11, wherein the first slot cycle index is 2 and the second slot cycle index is 0.

20 13. The method of claim 10, wherein using the selected failure-interval as a basis to determine when to re-page the mobile station comprises:

waiting for expiration of the failure-interval; and

upon expiration of the failure-interval, re-paging the mobile station at a next timeslot commensurate with the slot cycle index of the mobile station.

14. A method comprising:

receiving a signal indicative of an incoming communication for a first mobile station;

determining a first slot cycle index under which the first mobile station operates;

paging the first mobile station on a paging channel slot commensurate with the first slot

5 cycle index;

waiting a first interval to receive a page response from the first mobile station, and

making a first determination, upon expiration of the first interval, that a page failure has occurred;

responsive to the first determination, re-paging the first mobile station on a next paging

10 channel slot commensurate with the first slot cycle index;

receiving a signal indicative of an incoming communication for a second mobile station;

determining a second slot cycle index under which the second mobile station operates,

wherein the second slot cycle is different than the first slot cycle index;

paging the second mobile station on a paging channel slot commensurate with the second

15 slot cycle index;

waiting a second interval to receive a page response from the second mobile station, and

making a second determination, upon expiration of the second interval, that a page failure has occurred, wherein the second interval is different than the first interval; and

responsive to the second determination, re-paging the second mobile station on a next

20 paging channel slot commensurate with the second slot cycle index.

15. The method of claim 14, further comprising:

selecting the first interval based on the first slot cycle index; and

selecting the second interval based on the second slot cycle index.

16. The method of claim 15, further comprising:

selecting the first interval when paging the first mobile station; and

5 selecting the second interval when paging the second mobile station.

17. The method of claim 15, wherein:

the first slot cycle index is smaller than the second slot cycle index; and

the first interval is shorter than the second interval.